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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/774,495

02/10/2004

Sandor L. Barna

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EXAMINER

TRAN, NHAN T

ART UNIT

PAPER NUMBER

2622

MAIL DATE

DELIVERY MODE

07/26/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/774,495

Applicant(s)

BARNA ET AL.

Examiner

Nhan T. Tran

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 8-15, 17-20, 24 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8, 10-14, 17-20 and 25 is/are rejected.
- 7) ☒ Claim(s) 9, 15 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Preliminary Amendments

1. Preliminary amendments to specification and claims filed 2/10/2004 are acknowledged.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 2/10/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

3. The disclosure is objected to because of the following informalities:

The amendment to specification filed 2/10/2004 does not include the parent U.S. Patent No. 6,765,613. Specifically, the sentence "*The present application is a continuation application of United States patent application no. 09/359,065, filed on July 21, 1999, which claims the benefit of U.S. provisional application serial no. 60/093,842, filed on July 22, 1998 the disclosures of which are incorporated by reference herein.*" should be corrected to read as -- *The present application is a continuation application of United States patent application no. 09/359,065, filed on July 21, 1999, now U.S. Patent No. 6,765,613, which claims the benefit of U.S. provisional application serial no.*

60/093,842, filed on July 22, 1998 the disclosures of which are incorporated by reference herein. --.

Appropriate correction is required.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claim 1 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,765,613 in view of Zhou et al. (US 5,909,026).

Regarding claim 1, the instant claim 1 is broader in every aspect than the patent claim 1 except for the first, second and third image signals being amplified signals.

However, Zhou teaches an image sensor comprising active pixels (APS), each includes a source follower amplifier (215 shown in Fig. 2A and col. 4, line 59) for amplifying image signal before outputting the image signal to an image processing section. Such the implementation of active pixels including built-in amplifier is to increase signal-to-noise ratio as taught by Zhou in col. 2, lines 15-19.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of patent claim 1 and Zhou to include the built-in amplifier for each pixel as an active pixel so as to increase signal-to-noise ratio as taught by Zhou above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 8, 10-14, 17-20 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elabd (US 5,272,535) in view of Zhou et al. (US 5,909,026).

Regarding claim 1, Elabd discloses an image sensor (Figs. 1A & 2) comprising:
a plurality of image sensor pixels (pixels 16 shown in Fig. 2);
a noise reduction circuit (imaging device 10 shown in Fig. 2), said noise reduction circuit being adapted to receive receiving a first and second image signals (see Fig. 4D,

wherein first and second signals are represented by image signals output from pixel 0 and pixel 1), and being adapted to output a combination of said first and second image signals at a first time (a first pseudo interlace line), and said noise reduction circuit being adapted to receive a third image signal (image signal output from pixel 3 shown in Fig. 4D) and being adapted to output a combination of second and third image signals at a subsequent time (a second pseudo interlace line). See col. 7, lines 13-29.

Elabd are silent about that the first, second and third image signals are amplified prior to the combining process. However, Zhou teaches an image sensor comprising active pixels (APS), each includes a source follower amplifier (215 shown in Fig. 2A and col. 4, line 59) for amplifying image signal before outputting the image signal to an image processing section. Such the implementation of active pixels including built-in amplifier is to increase signal-to-noise ratio as taught by Zhou in col. 2, lines 35-39.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the image sensor in Elabd to include the built-in amplifier for each pixel as an active pixel in view of teaching of Zhou so as to increase signal-to-noise ratio.

Regarding claim 2, although Elabd discloses a noise reduction circuit as analyzed in claim 1, Elabd does not explicitly teach a fixed pattern noise reduction circuit, connected to receive said amplified image signals, and to remove at least one amplifier offset therefrom.

Zhou teaches a fixed pattern noise reduction circuit for removing amplifier offsets caused by the threshold mismatch in the source follower amplifiers prior to summation

of pixels so that a linear summation of photon-induced signals from the active pixels is properly achieved (see Zhou, col. 5, lines 23-30 and col. 6, lines 33-40).

Therefore, it would have been obvious to one of ordinary skill in the art to further provide a fixed pattern noise reduction circuit in Elabd connected to receive amplified image signals and to remove at least one amplifier offset therefrom so that a linear summation of photon-induced signals from the active pixels would be properly achieved as taught by Zhou.

Regarding claim 3, Elabd in view of Zhou clearly discloses that said amplifier offset includes amplifier offsets from different rows of a column (see Zhou, col. 5, lines 23-30).

Regarding claim 4, Zhou also discloses that the amplifier (Fig. 2B or equivalent circuits in Fig. 3A-D) comprises an operational amplifier (A), a feedback capacitor (CC1) connected across the operational amplifier and a gain setting capacitor (CM) at an input to the operational amplifier (col. 5, line 35 – col. 6, line 14). Zhou further suggests that the capacitance values shown in Figs. 2 & 3 represent typical values of an embodiment and should not be constructed as limitations of the invention (see col. 4, lines 54-57).

Therefore, it would have been obvious to one of ordinary skill in the art to alternatively configure the capacitance value to be variable so that a variable amplifier gain is realized for a highly operable circuitry.

Art Unit: 2622

Regarding claim 8, as shown by Zhou, a reset transistor (242) is coupled across the feedback capacitor (CC1) to reset a value of the feedback capacitor (see Zhou; Fig. 2B & 3C; col. 6, lines 1-6).

Regarding claim 10, as shown by Zhou, the image sensor pixels are active pixels (see claim 1), each of which including a photoreceptor, and in-pixel buffer transistor and an in-pixel selection transistor (see col. 4, lines 57-60).

Regarding claim 11, the method of binning pixels is also met by the combined teaching of Elabd and Zhou as analyzed in claim 1, wherein the pseudo interlace represents the binning process by adding adjacent pixel signals to generate pseudo interlace image as shown by Elabd in Fig. 4D.

Regarding claim 12, Elabd shows $n = 2$ in Fig. 4D.

Regarding claim 13, Elabd does not teach $n = 3$. However, Zhou teaches the size of summation kernels can be changed from $n=1$ to $n=4$ based on illumination condition to enhance signal to noise ratio (see col. 7, lines 1-8 & 54-67).

Therefore, it would have been obvious to one of ordinary skill in the art to enhance the method of binning pixels in Elabd by enabling changeable summation kernels ($n = 3$) based on illumination conditions to provide a better signal to noise ratio as taught by Zhou above.

Regarding claim 14, Elabd in view of Zhou also discloses noise removal to improve signal-to-noise ration (SNR). See Elabd, col. 7, lines 13-29.

Regarding claim 17, Elabd in view of Zhou discloses said first providing comprises obtaining a chronologically first amplified pixel and subsequent obtaining a chronologically second amplified pixel signal, and said adding to provide said first n-binned signal comprises adding said chronologically first and chronologically second amplified pixel signals (see pseudo interlace taught by Elabd, Fig. 4D and col. 7, lines 13-29 and note the combination of Elabd and Zhou for amplified signals).

Regarding claim 18, this claim is also met by the analysis of claim 2.

Regarding claim 19, this claim is also met by the analyses of claims 2, 11 & 18.

Regarding claim 20, Elabd in view of Zhou also discloses that the number of pixels added equals n ($n = 2$ as shown by Elabd for pseudo interlace in Fig. 4D) and said noise reduction circuit includes n noise reduction circuit parts (see Zhou, Figs. 2B-3D).

Regarding claim 25, Elabd in view of Zhou also discloses that said second providing comprises obtaining a third sensed pixel signal, and wherein said adding to

Art Unit: 2622

provide said second n-binned signal comprise adding said second and third sensed pixel signals (see claim 1 for second pseudo interlace line by adding the second and third pixel signals).

Allowable Subject Matter

6. Claims 9, 15 & 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

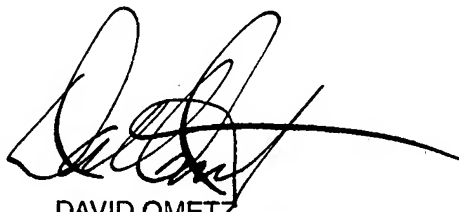
Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (571) 272-7371. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NHAN T. TRAN
Patent Examiner

A handwritten signature in black ink, appearing to read 'David Ometz', with a long horizontal stroke extending to the right.

DAVID OMETZ
SUPERVISORY PATENT EXAMINER